

in its character, like Mr. Galton's composite photographs of the average blackguard? And if it be a symbol of some kind, must it not be a symbol that stands for strange man in general, since there is nothing to suggest any particular strange man? But if this be so, and if a general conception is one which stands not for a particular object, but for a group of objects, I do not see how we can deny general conceptions, in this sense of the word, to our four-footed friends. And if the word abstract idea stand, as it is sometimes made to do, for general conception, we must admit, I think, that such abstract ideas are possible for the brute.

We come now to such abstract ideas as result from the process I termed isolation. Are these, too, possible for the brute? I have only to say that it has always seemed to me that when we speak of being able to form abstract ideas of redness, emptiness, justice, and the like, all we can possibly mean is that we can make use of the *words* as symbols in a train of thought. I have only to say this to indicate the nature of my answer to this question, I believe such abstract ideas to be impossible for the brute, I believe them to be the outcome of the use of language. We see a plum, and we find that it is round, and blue, and resisting. From these words we form abstract nouns, roundness, blueness, resistance. We then proceed to manufacture a something to which each of these words may answer, and we call that something a quality. Having thus made the quality, the next thing we do is to try and endow it with a separate existence, and to the results of our endeavours we give the name abstract idea. All this is a process which grows out of our use of words under the influence of a developed power of reflection; it is an attempt to conceive a reality-in-thought answering to certain of our symbols. Without a considerably developed use of symbols such a process is impossible. Hence I believe that no animal can form an abstract idea in this sense of the term. He does not possess the only possible means of doing so. To form such abstract ideas as these, is certainly "an excellency which the faculties of brutes do by no means attain to." Here we may agree with Locke and his followers.

May we say, then, that the power of forming abstract ideas, in this sense, is that which distinguishes the intelligence of man from the intelligence of the brute? I think not. There are, I believe, among the lower races of man, whole tribes which are unable to form abstract ideas. Abstract ideas are made possible by language, but the use of language does not necessarily imply the ability to form abstract ideas. Philologists tell us that there are languages or dialects in which no abstract words are to be found. This, however, is certain, that there is no known savage tribe which has no language. Man is the one being that can make use of spoken signs.

But it may be said that, although their language differs from ours, animals too have their language, imperfect it is true but still a language of their own, a means of communication with their fellows. And this is perfectly true. It is true, too, that my dogs can understand *my* language. But all that a dog can communicate to his fellow—all that I can communicate to my dog is a sign which he has learnt to associate with certain feelings or with certain actions to be performed. The communication deals, too, with immediate feeling or action; its sphere is the here and the now. There can be no doubt that dogs associate with barking in certain tones, special emotional states in their companions. In fact it is probable that dogs can in this way communicate with each other a wide range of states of feeling. But these states are present states, not states past or future. They are their own states, not the states

of thinking in pictures—pictures far truer and more beautiful than even they could describe in words. All processes of thought, in fact, are carried on by association. And in the chain of association there may be links of all kinds furnished by all the senses we possess. All that we can say with regard to man is that he adds to the natural symbols which form links in this chain of association, certain arbitrary symbols of his own manufacture.

of others. A dog can call his companions' attention to a worriable cat, or he may have his attention roused by my exclaiming "cat." But no dog could tell his companion of the successful "worry" he had just enjoyed or suggest that they should go out for a "worry" to-morrow morning. And here we come upon what seems to me the fact which raises man so immeasurably above the level of the brute. *The brute has to be contented with the experience he inherits or individually acquires. Man, through language spoken or written, profits by the experience of his fellows.* Even the most savage tribe has traditions extending back to the father's father (Sproat). And the civilised man—has he not in his libraries the recorded results of many centuries of ever widening experience and ever deepening thought? Thus it is that language has made us men. By means of language and language alone has human thought become possible. This it is which has placed so enormous a gap between the mind of man and the mind of the dog. Through language each human being becomes the inheritor of the accumulated thought and experience of the whole human race. Through language has the higher abstract thought become possible.

But though I look upon the difference between human intelligence and brute intelligence as very great, *I do not believe that there is any one faculty which all men possess and which no brute possesses.* I have already stated my views on the subject of abstraction, and to what I have said I have nothing now to add. But concerning the converse process of *construction* or *object*—forming a few words may be said. Let me first explain what I mean by construction. Our conception of an object is the result of a synthesis of its qualities. But this synthesis is, I imagine, of two kinds. There is a synthesis by immediate association, and a synthesis by reflection. When a dog sees before him a soaked dog-biscuit, his conception of the object is a synthesis by immediate association. The sight of the biscuit at once suggests by association a certain smell and taste. The object he mentally constructs is built up of these three, sight, smell, and taste. All other properties are rejected or eliminated. Now, suppose the dog capable of reflecting thus—the biscuit is light enough to carry, soft enough to bite, cool enough not to burn my mouth—he would then add to his synthesis by immediate association, a further synthesis by reflection, and would construct a more complete object. By the synthesis by reflection, in fact, all those qualities are added which are unconsciously eliminated in the immediate construction by association. I do not imagine that brutes have sufficient power of reflection to affect to any great extent this further synthesis. Indeed I imagine that savages and young children do not habitually go further than the construction by association. The further process has been added mainly under the influence of a developed language. The *word* groups around itself not only the cluster of associated ideas which make up the ordinary unreflecting conception of the object it symbolizes, but also all those further ideas which are the result of scientific study. The word is the peg upon which we hang those abstract qualities which by means of words we have isolated.

C. LLOYD MORGAN

#### AINO ETHNOLOGY

THE already somewhat voluminous literature of the Aino race has been recently increased by two valuable memoirs by competent original observers.<sup>1</sup> Hence, if neither Dr. Scheube nor Herr von Siebold has anything very new to tell us, it may be fairly concluded that most of the available data have now been collected. Extended research in the unexplored districts of Yezo may doubtless bring to light some further interesting facts

<sup>1</sup> "Die Ainos," von Dr. B. Scheube, Yokohama, 1882; and "Ethnologische Studien über die Aino auf der Insel Yezo, von Heinrich von Siebold, Berlin, 1881.

bearing on the physical and social characteristics of the aborigines. But no fresh discoveries of any moment are likely to be made, nor is it at all probable that anything will be brought forward in the least calculated to shake the general conclusions already arrived at.

Until the appearance of Herr Rein's large work on Japan,<sup>1</sup> one of the most universally-accepted of these conclusions was that, whatever be their affinities, the Ainos must certainly be separated from the Mongolic connection. No little surprise was accordingly produced by Rein's attempt to affiliate them to the surrounding members of the Yellow Race. But it was soon seen that his arguments, apparently inspired by a love of paradox, were sufficiently refuted by the very illustrations of the Aino type introduced into his work. It is therefore satisfactory to find that his views meet with no countenance in these memoirs, the authors of which emphatically reject the Mongol theory. "I cannot discover," writes Dr. Scheube, "the Mongolic type in the Ainos. The great development of the hair, the disposition of the eyes, the nasal formation, the moderate breadth between the cheek bones, the absence of prognathism, are all so many traits separating them from the Mongolians" (p. 3). So also Siebold: "The whole physiognomy and configuration of the Ainos has little of a Mongol character. The general impression they made on me was rather that of Europeans living under unfavourable conditions. I had a feeling, which also seemed to dawn upon them, that I was not associating with an alien race; and however strange it may appear, I cannot but compare the Ainos with the Russian peasantry" (p. 10).

Topinard had already declared that "the Ainos of Japan, the Miaotze, and the Lolos of the province of Yunnan belong, in my opinion, to the European group" ("Anthropology," p. 476). And it is extremely suggestive to find this writer also comparing them with the inhabitants of the Moscow district. "Chose absolument singulière, ce type célèbre des Ainos, avec ses traits aujourd'hui bien connus et sa barbe inculte, serait celui de certains paysans russes des environs de Moscou" (*Rev. d'Anthrop.*, 1879, p. 637). The same resemblance with the Russians has no doubt been detected in the Itelmen people of Kamchatka and among some of the Ghiliak tribes of the Lower Amur districts. But the presence of the Aino element has long been suspected in both of these regions. Most of the Kurile islands are still peopled by them, while the nomenclature of the whole archipelago is distinctly Aino, as shown by the term *Moshir* = *Island*, reaching as far north as *Para-moshir*, close to Cape Lopatka, at the extremity of Kamchatka. In the Lower Amur valley also W. G. Aston speaks of an Aino tribe called Santal or Sandan (*Church Missionary Intelligencer*, August, 1879); Siebold (p. 12) refers the Kilengs and Kachengs of the neighbouring Hingpu River to the same connection, and also mentions certain Aino communities about Castries Bay, over against Sakhalin. The southern portion of this island is itself Aino domain, although, since its annexation to Russia, a considerable emigration has set in towards Yeso. In Nippon the Japanese records bring the Aino at least as far south as the latitude of Tokio, whence they were gradually driven north or absorbed, leaving traces of their presence both in the Japanese type and in the geographical terminology of the northern provinces of the main island. Lastly, the national traditions point to North-East Asia as the region whence they migrated to their present homes.

It is thus sufficiently evident that the Mozin (Mao-chin, i.e. "Hairy Men"), as both the Chinese and Japanese often call them, were formerly far more widely diffused than at present. And this renders more intelligible the feeling with which the Ainos, i.e. "Men," as the word means in their language, at one time regarded themselves as the centre of the universe, a feeling embodied in the old

national song: "Gods of the sea, open your divine eyes. Wherever your eyes turn, there echoes the sound of the Aino speech."

This speech, as might be expected, shows not the slightest resemblance to the Japanese, or to any of the idioms current amongst the surrounding Mongoloid peoples. Siebold, who points at a relationship with the Itelmen, a relationship denied by the elder Siebold, has collected copious materials for its study, but, pending the publication of these materials, the student must rest satisfied with the somewhat meagre account contained in Dr. Scheube's memoir. From this the Aino language appears to be of an extremely primitive type, scarcely on a higher level than was the extinct Tasmanian, and, like it, supplementing its scant relational forms by means of signs and gestures. Thus the ideas of affirmation and negation, for which there are no distinct terms, are respectively conveyed by a nod and a shake of the right hand or else of the head. Winking also plays a large part in supplementing grammatical concepts.

There are, of course, no nominal or verbal inflexions beyond a sort of passive restricted to some verbs, and formed by combining the root with what appears to be the substantive verb prefixed. Thus *KIK* = to strike; *an-kik* = to be struck, from *an* or *ana* = to be (?). The parts of speech seem to be restricted to the noun, adjective, verb, a few adverbs and pronouns, of which latter the first and second only have been developed. This absence of a third personal pronoun places Aino at the very bottom of the scale in linguistic evolution, and this low position is further shown by its absolutely isolating condition. Although polysyllabic, it has not yet reached the agglutinating stage, so that each word in the sentence remains isolated, as in Chinese. Thus:—

Koandi dándó oman = I go to-day.

Koandi núman oman = I go yesterday.

Koandi inháta oman = I go to-morrow.

But it differs from the Indo-Chinese, and approaches the American polysynthetic system in the extent to which it has carried word-building. This important feature is not noticed by Scheube, who is no philologist, but attention has been called to it by Dr. A. Anuchin, in an able paper on the Ainos in the *Memoirs of the Russian Society of Natural Science*, vol. xx., Supplement, Moscow, 1877. A curious instance is the word *Kamui*, the general term for God, or any minor deity, which both Scheube and Siebold seem disposed in some way to connect with the Japanese *Kami*. In reality it is an Aino compound form derived from *Kam-trui* = "flesh-strong," that is, rich in flesh. Before their contact with the Japanese the great god of the Ainos was the bear, as it still is of the Ghiliaks, and some other Amur tribes. As is well known from Miss Bird's "Unbeaten Tracks," and other sources, this animal is not only worshipped, but also killed and eaten at certain periods, and with much ceremony, by all these primitive peoples. To be rich in flesh came thus to be regarded as the highest attribute of the deity, and when the etymology was forgotten, *Kamui* was easily generalised as a name applicable to any god. Have the divinities of Aryan mythology any less realistic origin?

It may be incidentally remarked that in these memoirs Miss Bird's very graphic description of the physical features, habits, and customs of the natives of Yeso, is fully confirmed in nearly all their details. An important exception is the texture of the hair, which according to her, "never shows any tendency to curl." But the hair of seven Ainos from different parts of Yeso, examined by Dr. Scheube, is, with one exception, described as more or less "gelockt," that is, "curled" or "ringletted." Of one the hair is said to be "überall gekräuselt," frizzled or frizzled all over. Except amongst the Aborigines of the south-west Chinese highlands, one may travel over the whole of China, Tibet, and Mongolia, without meeting a single case of even wavy, much less curled hair.

<sup>1</sup> "Japan nach Reisen und Studien," 2 vols., Leipzig, 1881.



And as the quality of the hair is a much more durable feature than the complexion, or almost any other physical trait, the necessity of separating the Ainos from the Mongolic stock becomes all the more obvious. If all this, combined with a distinct orthognathism, mesocephalic head (index No. 76), a light complexion, often scarcely darker than that of Europeans, brown iris, large well-shaped nose, and low cheek bones, is not sufficient to affiliate them to the Caucasian stock, then anthropologists must discover some other sufficiently differentiated physical type with which to group them. That various branches of the Caucasian race reached the East Asiatic seaboard in prehistoric times has been pointed out by this writer in a recent paper on the Koreans (see *NATURE*, vol. xxvi, p. 344). From Korea to the Japanese Archipelagos, the transition is easy, although it is not pretended that the line of migration necessarily followed this route. But enough has perhaps been stated to show that there is nothing extravagant in the theory of a Caucasian origin of the Aino race. Some of the intermediate links between them and their western kinsmen have already been brought to light. The others must be looked for in the still unexplored uplands of South-west China and Further India.

It is also to be noticed that the Ainos can only in a relative sense be regarded as the Aborigines of Yezo and Nippon. Scheube tells us that they are entirely ignorant of the potter's art (p. 11). But abundance of ancient pottery, often highly ornamented, has been found in many parts both of Hondo and Yezo. These remains are referred by the Ainos themselves to the extinct Koro-pok-Guru, or "People of the Hollows," their precursors in Yezo, who dwelt in huts built over pits, and who had a knowledge of pottery. The Japanese also refer the pits found on an island near Nemuro, north-east coast of Yezo, to the Kohito, a dwarfish race, said to have been exterminated by the Ainos, and apparently identical with the Koro-pok-Guru. It becomes a question whether with these potters, rather than with the Ainos, are to be associated the earthenware and other prehistoric remains found by Milne in the kitchen middens of the Tokio district and other parts of Japan. These remains show clear traces of cannibalism, a practice which seems entirely alien from the mild and inoffensive disposition of the Ainos.

But however this be, the present Aborigines seem destined at no distant date to disappear like their predecessors. The total number of full blood Ainos is estimated by Scheube at about 17,000 for Yezo, to which must be added, perhaps, 1000 or 1500 for Sakhalin and the Kuriles. Siebold, however, thinks that one-third of the inhabitants of Yezo, say 45,000 altogether, are either pure or half-caste Ainos. But the former are known to have decreased in the government of Sapporo from over 16,000 in 1871, to 13,326 in 1878, while the latter seem to be correspondingly on the increase. The result is inevitable—the effacement of the Ainos as a distinct nationality, and their ultimate absorption in the dominant race. The process that has been completed in Nippon is in rapid progress in Yezo.

A. H. KEANE

#### ON A NEW ARC ELECTRIC LAMP<sup>1</sup>

**E**LECTRIC lamps on the arc principle are almost as numerous as the trees in the forest, and it is somewhat fresh to come upon something that is novel. In these lamps the carbons are consumed as the current flows, and it is the variation in their consumption which occasions the flickering and irregularity of the light that is so irritating to the eyes. Special mechanical contrivances or regulators have to be used to compensate for this destruction of the carbons, as in the Siemens and

Brush type, or else refractory materials have to be combined with the carbons, as in the Jablochhoff candle and in the lamp Soleil. The steadiness of the light depends upon the regularity with which the carbons are moved towards each other as they are consumed, so as to maintain the electric resistance between them a constant quantity. Each lamp must have a certain elasticity of regulation of its own, to prevent irregularities from the variable material of carbon used, and from variations in the current itself and in the machinery.

In all electric lamps, except the Brockie, the regulator is in the lamp itself. In the Brockie system the regulation is automatic, and is made at certain rapid intervals by the motor engine. This causes a periodic blinking that is detrimental to this lamp for internal illumination.

M. Abdank, the inventor of the system which I have the pleasure of bringing before the Section, separates his regulator from his lamp. The regulator may be fixed

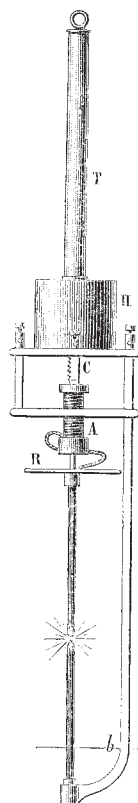


FIG. 1.

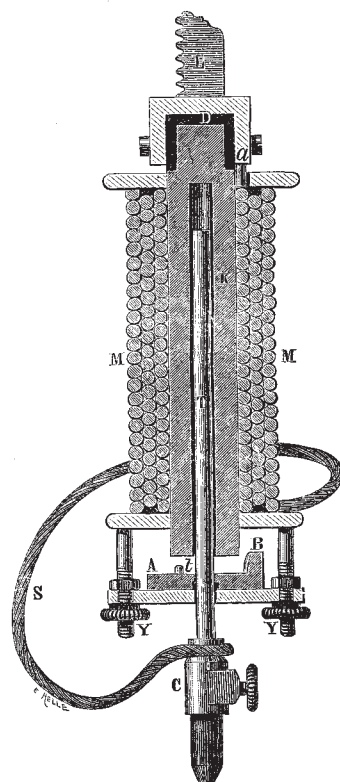


FIG. 2.

anywhere, within easy inspection and manipulation, and away from any disturbing influence in the lamp. The lamp can be fixed in any inaccessible place.

*The Lamp* (Figs. 1, 2, and 3).—The bottom or negative carbon is fixed, but the top or positive carbon is movable, in a vertical line. It is screwed at the point C to a brass rod, T (Fig. 2), which moves freely inside the tubular iron core of an electromagnet, K. This rod is clutched and lifted by the soft iron armature, A B, when a current passes through the coil, M M. The mass of the iron in the armature is distributed so that the greater portion is at one end, B, much nearer the pole than the other end. Hence this portion is attracted first, the armature assumes an inclined position, maintained by a brass button, Z, which prevents any adhesion between the armature and the core of the electromagnet. The electric connection between the carbon and the coil of the electromagnet is maintained by the flexible wire, S.

<sup>1</sup> Paper read at the British Association, Southampton. Revised by the Author.